

outright, and researchers were challenged to prove that the observed ozone depletion was well beyond natural variations.

This challenge was answered in 1985 when British researchers announced that they had found a huge ozone hole above Antarctica. This hole confounded scientists until 1987 when Molina, Rowland, and their colleagues discovered that manufactured chlorine compounds initiated a chain of chemical reactions on the surfaces of extremely cold polar stratospheric clouds, accelerating the destruction of ozone in this area.

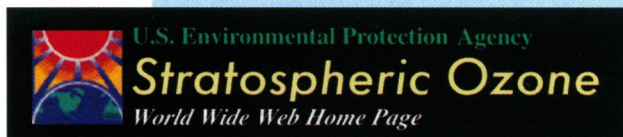
In 1987, through the United Nations' involvement, 24 industrial nations signed the Montreal Protocol, agreeing to set sharp limits on the use of CFCs and bromine-containing chemicals that also destroy ozone. The following year, DuPont, the world's largest manufacturer of CFCs, announced that it would begin moving toward discontinuing further production.

Calvert says, "DuPont scientists were a big help in proving the connections between ozone loss and CFCs. They honestly tried to find what the truth was." Michael Oppenheimer, an atmospheric scientist at the Environmental Defense Fund, agrees that ozone research has been "the best example of industry, government, and university scientists getting together and crafting a solution on an important environmental issue."

Under further tightening of the Montreal Protocol, the most dangerous gases will be totally banned by 1996, although developing countries have a few years to introduce substitutes for ozone-destroying chemicals. In 1995, however, Republicans in Congress introduced legislation that would stop the United States' participation in the ban on CFC production. But Oppenheimer sees "no ground swell of opposition" in Congress to the ozone treaty. Furthermore, the Nobel Prize in Chemistry shared by Molina, Rowland, and Crutzen "shows that the scientific basis for the Montreal Protocol is of the highest quality," he says. "On this issue, governments have been making policy based on the best science—period."

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When the 1995 Nobel Prize in Chemistry was awarded to Paul Crutzen, Mario Molina, and F. Sherwood Rowland for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone, the world's attention focused once again on ozone depletion. A World Wide Web site of the U.S. EPA (URL: <http://www.epa.gov/docs/ozone/index.html>) provides information on ozone depletion, regulations designed to protect stratospheric ozone, explanation of the UV index, and consumer information.



For novices in ozone research, the ozone depletion hyperlink is a good starting point. The questions and answers on ozone depletion section provides a layman's explanation

of the concern about ozone depletion. More technical information on ozone depletion can be found under sections including a fact sheet, United Nations Environment Programme Common Questions about Ozone, and Current Reports on Ozone Depletion by the World Meteorological Organization, NASA, and the British Antarctic Survey. To decipher some of the scientific jargon, many of the scientific terms used throughout the site are linked to a glossary.

One interesting feature of this Web page is the Ozone Depletion: Myth vs. Measurement hyperlink. Some of the most popular misconceptions about ozone depletion are dispelled here. The issues covered include CFCs, volcanoes, and whether a link exists between ozone depletion and higher UV levels. One of the newest additions to this site is an animated illustration of the ozone hole over the Antarctic. A series of images shows the change in percentage of ozone during the fall of 1995.

Users interested in the latest regulatory efforts by the EPA to prevent ozone depletion may access a hyperlink describing the methyl bromide phase-out. Methyl bromide is a pesticide used to control insects, nematodes, weeds, and rodents. It is also a significant ozone-depleting substance: recent scientific evidence indicates that bromine from this material is 50 times more effective at destroying ozone than chlorine from CFCs on a per-molecule basis. When this phase-out will occur, how it will affect current uses, and what alternatives exist for this pesticide are clearly outlined in this hyperlink. In addition, a hyperlink on the Montreal Protocol on Substances that Deplete the Ozone Layer details international actions to protect ozone.

Alternative products that consumers may consider that do not impact on ozone are provided in the Consumers and Ozone Protection hyperlink. Products discussed in this section include refrigerants, pesticides, solvents, halons such as aerosols, adhesives, and inks. This link also includes tips for how individuals can help protect the ozone layer. Users who are unable to access the Web site may obtain information about ozone depletion by calling the Ozone Protection Hotline at (800) 296-1996.